KALMAR SMARTRAIL®

DRIVE STRAIGHT – FIND THE BOX

Smartrail® Automatic Steering and Container Position Verification System for RTGs

PTP Malaysia: retrofit for 57 existing RTGs of various makes.

In order to increase the productivity of an RTG terminal, the travelling speed of the RTGs should be maximised, the incidence of lost containers should be decreased to zero, the handling time per container should be minimised and the location of the RTGs should be known at all times. In addition, there can be no compromises regarding the safety or reliability of the machine or operation. All of this can be successfully achieved when the RTGs in the yard are equipped with the Kalmar Smartrail.

The two main features of Smartrail are automatic steering and automatic container position verification, which greatly assist the RTG operator to perform the work more ergonomically, efficiently and safely.

GPS-based system

The Kalmar Smartrail is based on the latest GPS (Global Positioning System) technology and creates a far more flexible system than conventional automatic steering or container position verification methods. Conventional methods may require a painted line on the terminal surface, or a buried guide wire, or a magnetic or metallic tag attached to the terminal pavement.
Smartrail requires none of the above, nor any expensive civil engineering work in the terminal. This ensures that Smartrail can be introduced rapidly and much more cost effectively. Terminal layout changes or expansions can be achieved without any additional installations. As there are no vulnerable components installed at the ground level of the RTG, the system is extremely durable and practically maintenance free. Once installed, the only maintenance required is to clean the GPS antenna at six-monthly or yearly intervals, depending on the operating environment. The use of GPS satellites is free of charge.

Co-ordinates

The GPS system works in all weather conditions 365 days per year, which enables Smartrail to provide real time accuracy of 1 to 2 centimetres for more than 99% of the time. This is achieved by using the very latest technology, including a GPS base station to create a DGPS differential system. The Smartrail system receives global

longitude and latitude positions from the GPS receiver, which are first converted to local virtual co-ordinates. For container positioning purposes the virtual co-ordinates are converted to the customer's own local terminal co-ordinates - such as 15B43C5, where 15B = the container stack, 43 = the column, C = the row and 5 = the container stacking height or tier.

Automatic steering

The automatic steering feature in Smartrail guides the RTG by way of "virtual rails" programmed into the system's database, providing a typical steering accuracy of +/- 5cm (+/- 2 inches). As the virtual rails to be followed are stored in the memory of the system, they can be easily modified if required.

As the RTG moves from one container block to another, the Smartrail identifies the correct rail to follow automatically, without any intervention from the operator.

The crane operator controls the speed and travel direction even with the automatic steering mode activated. Automatic steering leaves the operator free to focus visually on the surrounding area of operation, instead of having to concentrate on manually steering the crane along the concrete runway.

This greatly reduces operator work stress and helps to avoid collisions, thus improving crane availability and reducing operational costs. Automatic steering ensures a much higher level of safety.

Automatic container position verification system

Smartrail sends an update message to the yard management system (YMS) each time a container is handled. This occurs when the container is picked up or placed down, either in the stack or onto a trailer. When containers are shuffled within the stack, this information is updated automatically on the YMS which ensures that all container positions in the stack are correctly recorded in the YMS. Even when the operator places the container in a different position from that proposed by the system, the automatic position verification feature reports this to the YMS, which means that containers are never lost.

Among other automatic messages sent to the YMS as containers are handled is the accurate RTG position when interrogated by the YMS for the purposes of future yard or work planning.

First Smartrails used with Kalmar RTGs in Cartagena Colombia. In operation since 1998.

Global, New Jersey: 5+3+2 Kalmar RTGs, all equipped with Smartrail.

Teaching the rails and stacks

Teaching a new yard to Smartrail is simple. The RTG is driven to the starting and end points of the new "virtual rail" for a container stack and the co-ordinates are recorded. When this has been done, the new container block is named. When the procedure has been performed for all RTG rails and container blocks in the entire yard layout, the database is copied to a PC from where it can be copied to all other RTGs in operation in the yard.

Easy and tested technology

The Smartrail system is physically connected to the radio data terminal (RDT) or the vehicle mounted terminal (VMT) located in the cabin of the RTG. These are the media normally used by container terminals to provide task assignments to the driver from the YMS. The connection method is the universal RS232 serial port and most YMS types possess the feature enabling the receipt of automatic position messages. The format for the position message is easily configured for utilisation in most YMS systems, including those systems created by the terminal's in house IT department.

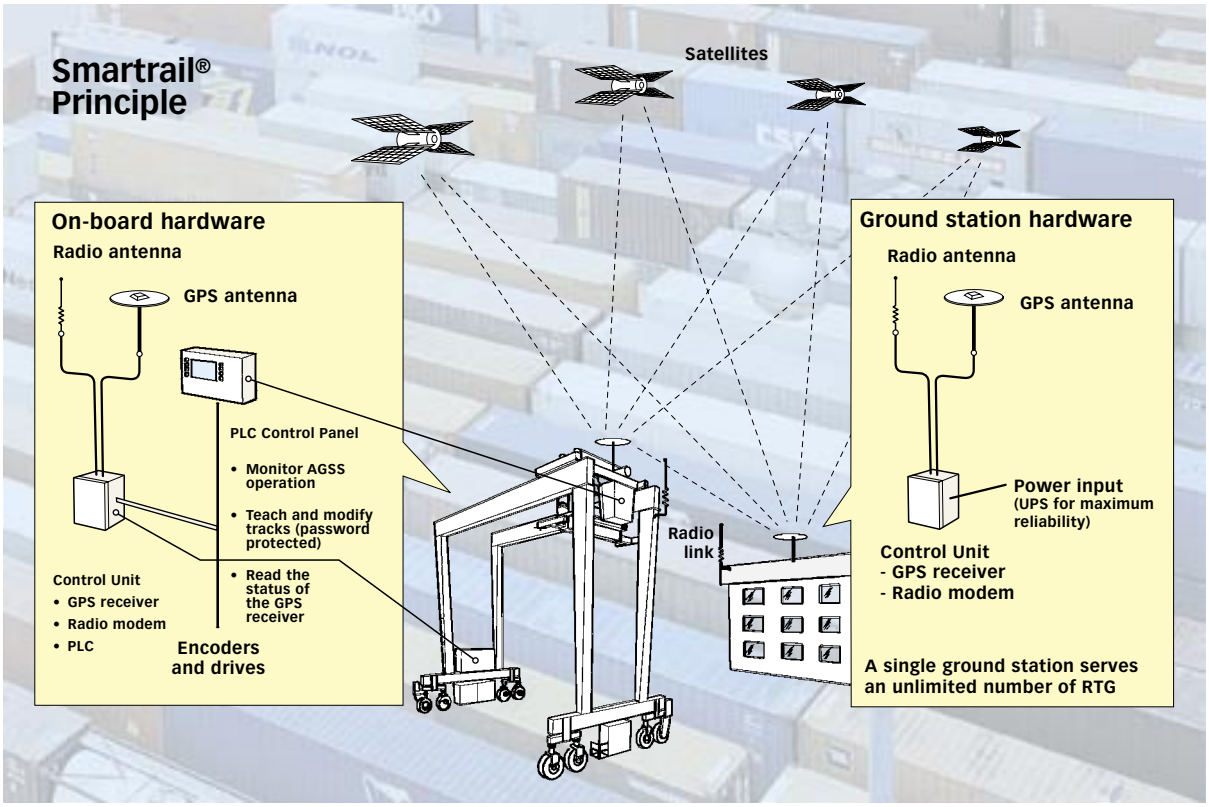
Retrofit for existing RTGs also possible

Smartrail is not only sold with most new Kalmar RTGs, but can also be retrofitted for existing Kalmar RTGs and for the RTGs of other manufacturers.

There are currently more retrofit Smartrail systems in operation than those supplied with new machines. This has proved very attractive for existing RTG operators, as the Smartrail system was specifically designed for easy installation in the after market, causing minimal interruption to terminal operations.

Retrofit Smartrails are all sold as turnkey projects. The possible engineering that any new RTG make or type might require is included in these projects.

Kalmar Smartrail® -improved RTG productivity and safety



Contact Information:

Kalmar Industries

Lifetime Business Partner

Kalmar is a global provider of heavy-duty materials handling equipment and services to ports, terminals and industrial users. We supply handling solutions, which enable our customers to operate with a high level of efficiency and reliability. Every 4th container or trailer transfer at terminals around the world is handled by a Kalmar machine.

Global Operation

Kalmar has product supply centres in Finland, Sweden, Malaysia, the Netherlands and the USA, 12 sales companies and more than 150 dealers around the world. Today, more than 65,000 Kalmar machines are in operation in environments ranging from sub-zero arctic climates to tropical humidity and heat. Our global experience and understanding of local conditions enable us to serve customers in all corners of the world.

Kalmar Solutions for Full Response

As customers seek to focus more on their core business, Kalmar Solutions offers flexibility and a switch from ownership to equipment availability. Our customer support services include spare parts, field service, financial solutions, service packages, refurbishing, upgrades and Total Fleet Management. Kalmar Solutions not only facilitate better equipment performance and continuous innovations, we also make an impact on your operational revenue growth.

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